ENVIRONMENTAL GEOSCIENCE - BS

The increasing demands that population growth and affluence put on the natural resources and the Earth's environment require greater numbers of trained professionals and informed citizens. The BS degree in Environmental Geosciences embraces all the disciplines of geosciences to give the student a rigorous interdisciplinary education including issues associated with environmental policy. The degree trains students for employment by industry, environmental and engineering consulting firms, non-governmental organizations, and governmental regulatory agencies, among other entities. Students focus coursework in a particular environmental theme: coastal and marine environments, water, human impact on the environment, climate change, or biosphere.

Program Requirements

First Year

Fall		**Semester Credit Hours**
CHEM 119	Fundamentals of Chemistry I	4
ENGL 104	Composition and Rhetoric	3
GEOS 105	Introduction to Environmental Geoscience	3
MATH 151	Engineering Mathematics I	4
	Semester Credit Hours	**14**
Spring		
CHEM 120	Fundamentals of Chemistry II	4
GEOS 205	Environmental Geosciences Cornerstone	1
MATH 152	Engineering Mathematics II	4
POLS 206	American National Government	3
Creative arts (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#creative-arts) [1]		3
	Semester Credit Hours	**15**

Second Year

Fall		
BIOL 111	Introductory Biology I	4
GEOG 201	Introduction to Human Geography	3
Select one of the following: [2]		4
ATMO 201 & ATMO 202	Weather and Climate and Weather and Climate Laboratory	
GEOG 203 & GEOG 213	Planet Earth and Planet Earth Lab	
GEOL 101 & GEOL 102 or GEOL 150	Principles of Geology or Introduction to the Solid Earth	
OCNG 251 & OCNG 252	The Blue Planet - Our Oceans and The Blue Planet - Our Oceans Laboratory	
Language, philosophy and culture (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#language-philosophy-culture) [1]		3
	Semester Credit Hours	**14**
Spring		
BIOL 112	Introductory Biology II	4
POLS 207	State and Local Government	3
Select one of the following: [2]		4
ATMO 201 & ATMO 202	Weather and Climate and Weather and Climate Laboratory	
GEOG 203 & GEOG 213	Planet Earth and Planet Earth Lab	
GEOL 101 & GEOL 102 or GEOL 150	Principles of Geology or Introduction to the Solid Earth	
OCNG 251 & OCNG 252	The Blue Planet - Our Oceans and The Blue Planet - Our Oceans Laboratory	
Communication (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#communication)		3
	Semester Credit Hours	**14**

Third Year

Fall		
GEOG 330	Resources and the Environment	3
STAT 303 or STAT 211	Statistical Methods [3] or Principles of Statistics I	3
Select one of the following:		4
PHYS 201	College Physics [4]	
PHYS 206 & PHYS 226	Newtonian Mechanics for Engineering and Science and Physics of Motion Laboratory for the Sciences	
Environmental theme elective [5]		3
Technical elective [6]		3
	Semester Credit Hours	**16**
Spring		
GEOG 390	Principles of Geographic Information Systems [7]	4
GEOL 420	Environmental Geology	3
American history (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history)		3
Environmental theme elective [5]		3
Environmental policy elective [8]		3
	Semester Credit Hours	**16**

Fourth Year

Fall		
OCNG 470	Data Analysis Methods in Geosciences	4
American history (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history)		3
Environmental theme elective [5]		6
Technical elective [6]		3
	Semester Credit Hours	**16**
Spring		
GEOS 405	Environmental Geosciences	3
Environmental theme elective [5]		6

Environmental policy elective [8]		3
Technical elective [6]		3
	Semester Credit Hours	**15**
	Total Semester Credit Hours	**120**

[1] The graduation requirements include three hours of international and cultural diversity courses and three hours of cultural discourse courses. A course satisfying a Core category, a college/department requirement, or a free elective can be used to satisfy this requirement. See academic advisor.

[2] Select one introductory course in the first semester and an additional one in the second semester of the sophomore year. Seek guidance from the academic advisor for Environmental Programs in Geosciences (ENVP) or your faculty mentor.

[3] STAT 211 is recommended for the Coastal and Marine Environment Theme.

[4] PHYS 206 and PHYS 226 is recommended for the Coastal and Marine Environment Theme.

[5] Select 18 hours of theme courses in your junior and senior years in consultation with your academic advisor or faculty mentor from the list below.
Internship courses can be taken for up to 6 credits and will normally be used as an adjustment to theme electives, but depending on the content of the internship credit, it can be applied as an adjustment to your technical electives or policy electives. Seek guidance from the ENVP academic advisor.

[6] Other courses which match the Environmental Programs' technical electives definition will be allowed by adjustment. Guidance about technical electives (including the definition used by the Environmental Programs in Geosciences) can be found on the programs' website. Seek guidance about choices from the ENVP academic advisor or faculty mentor.

[7] GEOG 390 is a required technical elective.

[8] Seek guidance about choices from the ENVP academic advisor or faculty mentor.

Two courses in the degree plan must be writing intensive courses designated by the Environmental Programs in the schedule of classes. Also, international and cultural diversity electives (3 hours) and cultural discourse electives (3 hours) must be incorporated into the degree.

Code	Title	Semester Credit Hours
Environmental Theme Electives		
Climate Change		
ATMO 210	Climate Change	3
ATMO 444	The Science and Politics of Global Climate Change	3
PHYS 202	College Physics	4
Select the remaining courses from the following:		
AGSM 477	Air Pollution Control and Regulatory Compliance	3
ATMO 363	Introduction to Atmospheric Chemistry and Air Pollution	3
ATMO 463	Air Quality	3
GEOG 324	Global Climatic Regions	3
GEOG 360	Natural Hazards	3
GEOG 442/ GEOS 442	Past Climates	3
GEOL 306	Sedimentology and Stratigraphy	4
GEOL 451	Introduction to Geochemistry	3
GEOS 410	Global Change	3
GEOS 442/ GEOG 442	Past Climates	3
GEOS 443	Global Biogeochemical Cycles	3
OCNG 310	Physical Oceanography	3
OCNG 340	Chemical Oceanography	3
OCNG 413	Polar Regions of the Earth: Science, Society and Discovery	3
Coastal and Marine Environments		
GEOG 370/ GEOS 370	Coastal Processes	3
or OCNG 41	or Global Oceanography	
Select the remaining courses from the following:		
BIOL 440	Marine Biology	4
GEOG 331	Geomorphology	3
GEOG 360	Natural Hazards	3
GEOL 306	Sedimentology and Stratigraphy	4
GEOL 440	Engineering Geology	3
OCNG 310	Physical Oceanography	3
OCNG 320	Biological Oceanography	3
OCNG 330	Geological Oceanography	3
OCNG 340	Chemical Oceanography	3
OCNG 350	Marine Pollution	3
OCNG 404	Ocean Observing Systems	3
OCNG 413	Polar Regions of the Earth: Science, Society and Discovery	3
OCNG 425	Microbial Oceanography	3
OCNG 443	Oceanographic Field and Laboratory Methods	3
OCNG 453	Hydrothermal Vents and Mid-Ocean Ridges	3
RWFM 404	Aquatic Ecosystems	3
RWFM 418	Ecology of the Coastal Zone	3
WFSC 425	Marine Fisheries	3
Human Impact on the Environment		
GEOS 410	Global Change	3
GEOG 430	Environmental Justice	3
Select the remaining courses from the following:		
AGSM 477	Air Pollution Control and Regulatory Compliance	3
ARCH 421	Energy and Sustainable Architecture	3
ATMO 326	Environmental Atmospheric Science	3
ATMO 363	Introduction to Atmospheric Chemistry and Air Pollution	3
ATMO 444	The Science and Politics of Global Climate Change	3
BESC 367	U.S. Environmental Regulations	3
ECCB 318/ RWFM 318	Coupled Social and Ecological Systems	3

ECCB 320	Ecosystem Restoration and Management	3
GEOG 309	Geography of Energy	3
GEOG 360	Natural Hazards	3
GEOG 401	Political Geography	3
GEOL 301	Mineral Resources	3
GEOL 404	Geology of Petroleum	3
GEOL 410	Hydrogeology	3
GEOL 440	Engineering Geology	3
GEOL 451	Introduction to Geochemistry	3
GEOS 430	Global Science and Policy Making	3
GEOS 431	Environmental Regulatory Compliance in Geoscience	3
OCNG 350	Marine Pollution	3
OCNG 413	Polar Regions of the Earth: Science, Society and Discovery	3
RWFM 420	Ecology and Society	3
SENG 321	Safety Management Systems	3
URPN 361	Urban Issues	3
Water		
GEOG 434	Hydrology and Environment	4
GEOL 410	Hydrogeology	3
Select the remaining courses from the following:		
AGSM 335	Water and Soil Management	3
AGSM 337	Technology for Environmental and Natural Resource Engineering	3
ATMO 251	Weather Observation and Analysis	3
ATMO 335	Atmospheric Thermodynamics	3
ATMO 352	Severe Weather and Mesoscale Forecasting	3
ATMO 443	Radar Meteorology	3
BESC 320	Water and the Bioenvironmental Sciences	3
ECCB 301	Diversity and Evolution of Plants	3
ECCB 420	Ecological Restoration of Wetland and Riparian Systems	3
GEOG 324	Global Climatic Regions	3
GEOG 331	Geomorphology	3
GEOG 360	Natural Hazards	3
GEOG 400	Arid Lands Geomorphology	3
GEOL 412	Environmental Hydrogeology	3
GEOL 440	Engineering Geology	3
GEOL 451	Introduction to Geochemistry	3
GEOS 443	Global Biogeochemical Cycles	3
OCNG 340	Chemical Oceanography	3
OCNG 350	Marine Pollution	3
OCNG 413	Polar Regions of the Earth: Science, Society and Discovery	3
OCNG 425	Microbial Oceanography	3
RWFM 404	Aquatic Ecosystems	3
RWFM 325	Watershed Analysis and Planning	3
RWFM 440	Wetland Delineation	3
SCSC 301	Soil Science	4
SCSC 309	Water in Soils and Plants	4
SCSC 310	Soil Morphology and Interpretations	2
SCSC 405	Soil and Water Microbiology	3
SCSC 455	Environmental Soil and Water Science	3
SCSC 458	Watershed, Water and Soil Quality Management	3
Biosphere		
GEOG 335	Pattern and Process in Biogeography	3
OCNG 320	Biological Oceanography	3
Select the remaining courses from the following:		
BIOL 214	Genes, Ecology and Evolution	3
BIOL 357 & BIOL 358	Ecology and Ecology Laboratory	4
BESC 401	Bioenvironmental Microbiology	3
BESC 402	Microbial Processes in Bioremediation	3
ESSM 306	Plant Functional Ecology and Adaptation	3
ECCB 307	Forest Protection	3
ECCB 309	Forest Ecology	3
ECCB 320	Ecosystem Restoration and Management	3
ECCB 403	Population and Community Ecology	3
ECCB 416	Fire Ecology and Natural Resource Management	3
ECCB 420	Ecological Restoration of Wetland and Riparian Systems	3
ECCB 430	Advanced Restoration Ecology	3
GENE 302 & GENE 312	Principles of Genetics and Comprehensive Genetics Laboratory	4
GENE 412	Population, Quantitative and Ecological Genetics	3
GEOG 435	Principles of Plant Geography	3
GEOG 442/ GEOS 442	Past Climates	3
GEOL 314	Paleontology and Geobiology	4
GEOS 442/ GEOG 442	Past Climates	3
GEOS 443	Global Biogeochemical Cycles	3
OCNG 425	Microbial Oceanography	3
OCNG 453	Hydrothermal Vents and Mid-Ocean Ridges	3
RWFM 306	Wildlife and the Changing Environment	3
RWFM 404	Aquatic Ecosystems	3
RWFM 419	Wildlife Restoration	3
SCSC 301	Soil Science	4
SCSC 405	Soil and Water Microbiology	3

Code	Title	Semester Credit Hours
Technical Electives		
AGSM 337	Technology for Environmental and Natural Resource Engineering	3
AGSM 360	Occupational Safety Management	3
ATMO 321	Computer Applications in the Atmospheric Sciences	3
ATMO 464	Laboratory Methods in Atmospheric Sciences	3
BESC 403	Sampling and Environmental Monitoring	3
CHEM 227	Organic Chemistry I	3
CHEM 228	Organic Chemistry II	3
CHEM 237	Organic Chemistry Laboratory	1
CHEM 238	Organic Chemistry Laboratory	1
CHEM 383	Chemistry of Environmental Pollution	3
CHEM 483	Green Chemistry	3
ECCB 308	Fundamentals of Environmental Decision-Making	3
ECCB 406/ GEOG 462	Advanced GIS Analysis for Natural Resources Management	3
ECCB 444	Remote Sensing of the Environment	3
GEOG 312	Data Analysis in Geography	3
GEOG 352/ GEOL 352	GNSS in the Geosciences	3
GEOG 361	Remote Sensing in Geosciences	4
GEOG 380	Workshop in Environmental Studies	2-6
GEOG 391	Geodatabases	4
GEOG 392	GIS Programming	4
GEOG 398	Interpretation of Aerial Photographs	3
GEOG 450	Field Geography	3
GEOG 461	Digital Image Processing in the Geosciences	4
GEOG 462/ ECCB 406	Advanced GIS Analysis for Natural Resources Management	3
GEOG 467	Dynamic Modeling of Earth and Environmental Systems	4
GEOG 475	Advanced Topics in GIS (Geographic Information Systems)	4
GEOG 477	Terrain Analysis and Mapping	4
GEOG 478	WebGIS	4
GEOL 306	Sedimentology and Stratigraphy	4
GEOL 330	Geologic Field Trips	1-3
MATH 251	Engineering Mathematics III	3
MATH 253	Engineering Mathematics III	4
MATH 308	Differential Equations	3
OCNG 451	Mathematical Modeling of Ocean Climate	4
OCNG 456	MATLAB Programming for Ocean Sciences	3
OCNG 469	Python for Geosciences	3
PHLT 335	Hazardous Materials	3
PHYS 202	College Physics	4
PHYS 207	Electricity and Magnetism for Engineering and Science	3
PHYS 227	Electricity and Magnetism Laboratory for the Sciences	1
STAT 212	Principles of Statistics II	3
STAT 335/ CSCE 320	Principles of Data Science	3
STAT 407	Principles of Sample Surveys	3

Code	Title	Semester Credit Hours
Environmental Policy Electives		
AGEC 350	Environmental and Natural Resource Economics	3
AGEC 420	Food Security, Climate and Conflict	3
AGEC 422	Land Economics	3
ANTH 461	Environmental Archaeology	3
ARCH 213	Sustainable Architecture	3
ARCH 421	Energy and Sustainable Architecture	3
ATMO 444	The Science and Politics of Global Climate Change	3
BESC 311	International Perspectives on Environmental Issues	3
BESC 367	U.S. Environmental Regulations	3
BESC 411	Environmental Health and Safety Compliance	3
ECCB 460/ RPTS 460	Nature, Values, and Protected Areas	3
ECON 202	Principles of Economics	3
ECON 203	Principles of Economics	3
ECON 323	Microeconomic Theory	3
GEOG 304	Economic Geography	3
GEOG 306	Introduction to Urban Geography	3
GEOG 309	Geography of Energy	3
GEOG 401	Political Geography	3
GEOG 406	Geographic Perspectives on Contemporary Urban Issues	3
GEOG 430	Environmental Justice	3
GEOS 430	Global Science and Policy Making	3
PHIL 314	Environmental Ethics	3
PHLT 330	The Environment and Public Health	3
POLS 347	Politics of Energy and the Environment	3
POLS 440	Public Policies and Policymaking	3
RELS 420	Religion and the Environment	3
RWFM 375	Conservation of Natural Resources	3
RWFM 470	Environmental Impact Assessment	3
SOCI 328	Environmental Sociology	3
SOCI 450/ MGMT 478	Social Entrepreneurship	3
URPN 202	Building Better Cities	3
URPN 203	Smart Cities - Bit, Bots and Beyond	3
URPN 360	Issues in Environmental Quality	3

URPN 361	Urban Issues	3
URPN 371	Environmental Health Planning and Policy	3
URPN 460	Sustainable Communities	3
URPN 467	Land and Property Aspects of Sustainable Development	3